Ansys Simulations:
Field Uniformity for TPC/Cherenkov Prototype

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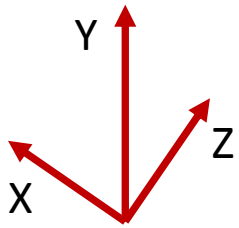
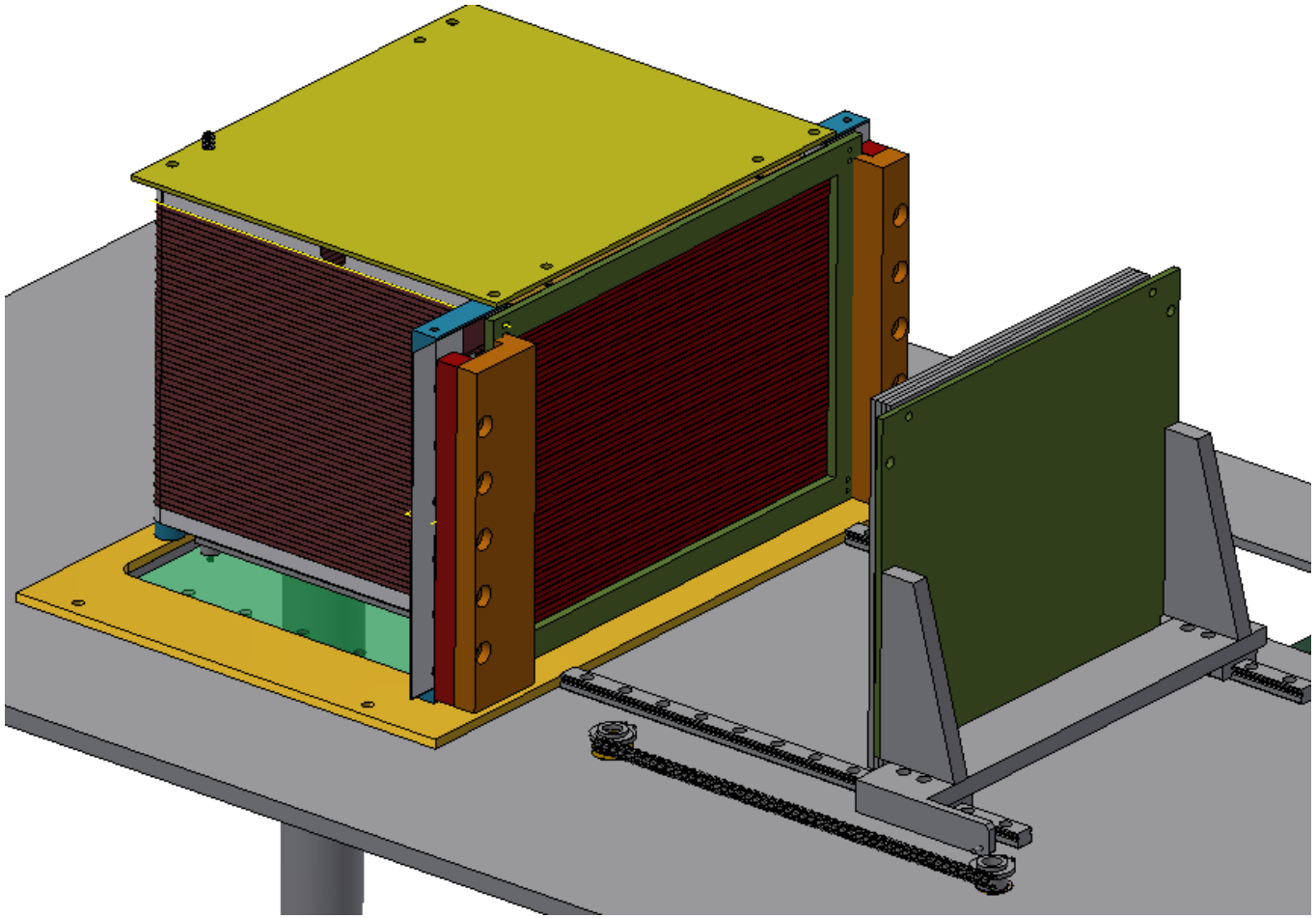
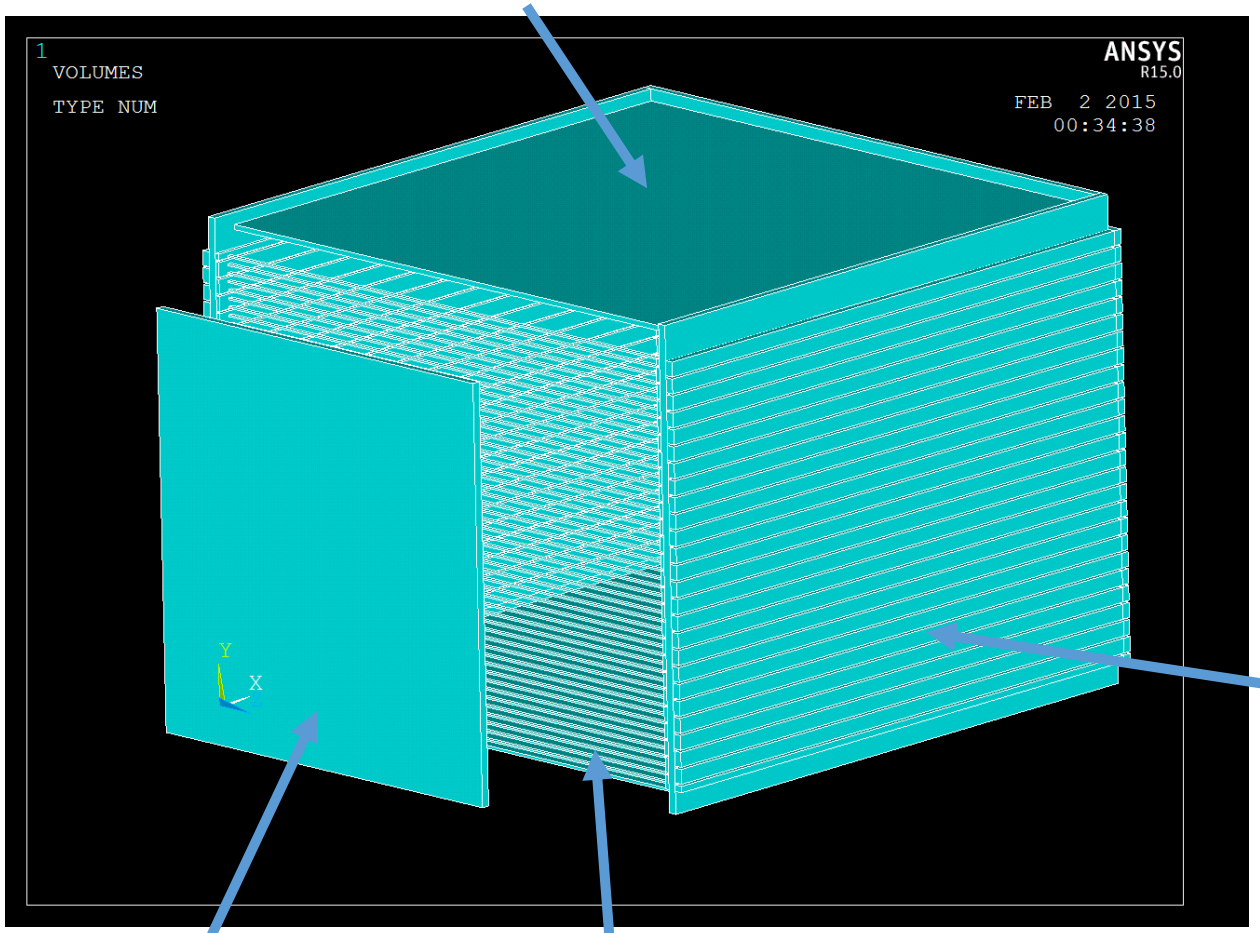
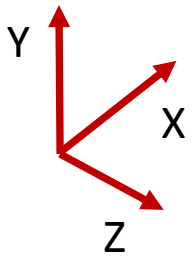
Full Assembly





ANSYS Geometry



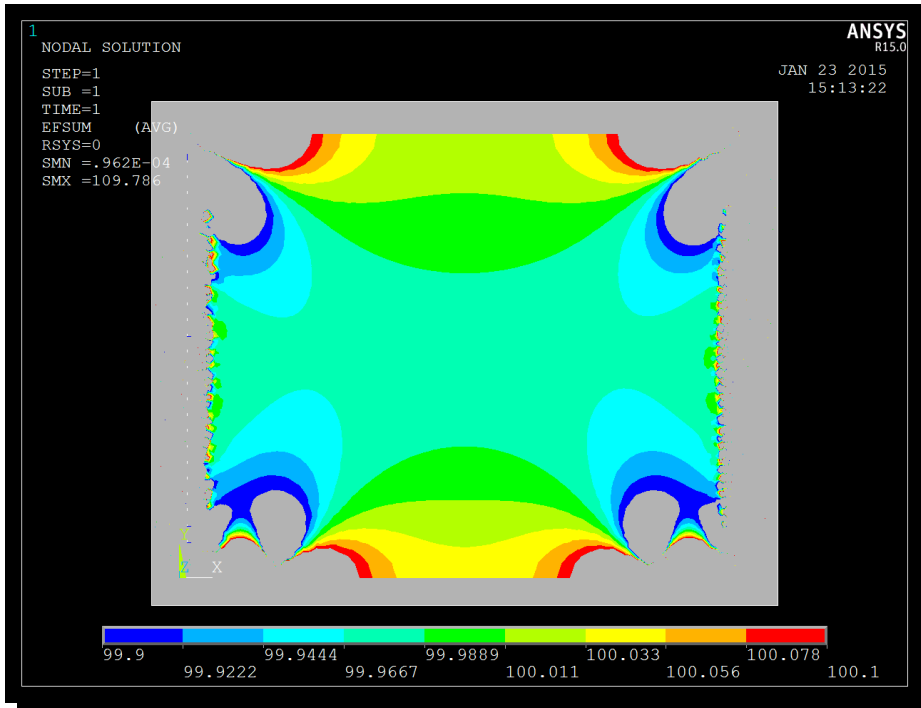


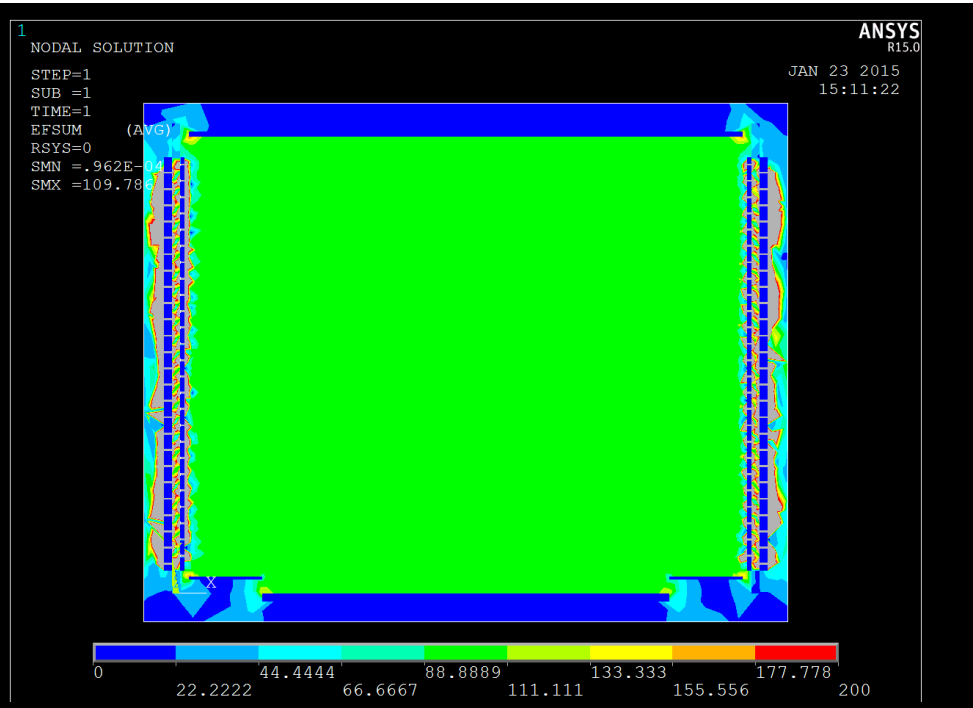
4 walls of strips vs.
3 walls of strips/1 of wire

No Cherenkov mesh, 51 wires (0.15 mm width),
25.5 strips (3.5 mm width)

EF Vector Sum of
XY Slice in middle of Z
(drift direction is down)

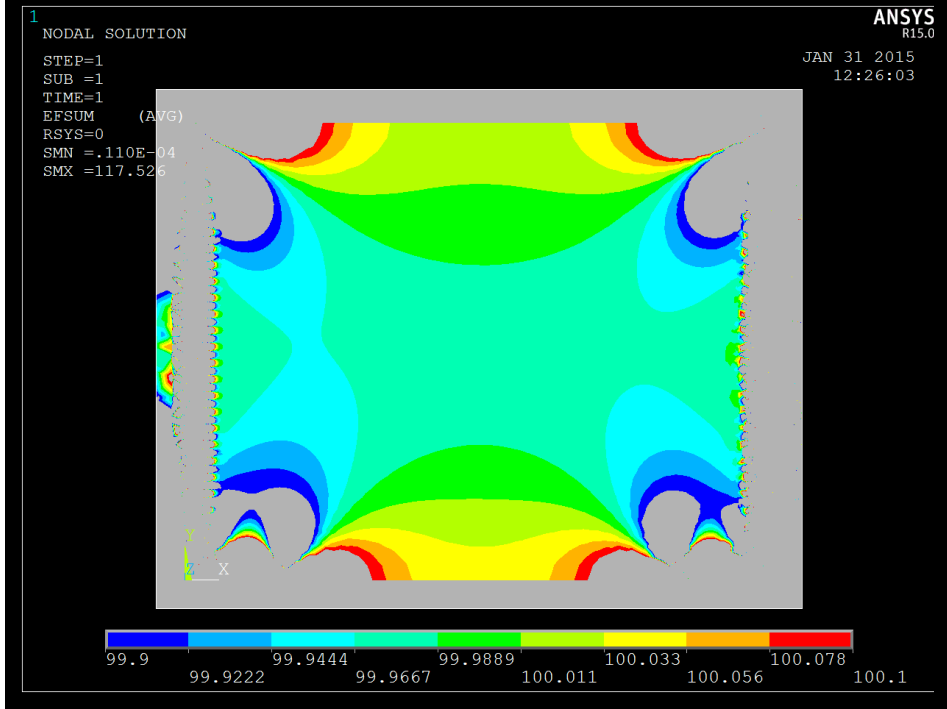
4 walls of strips

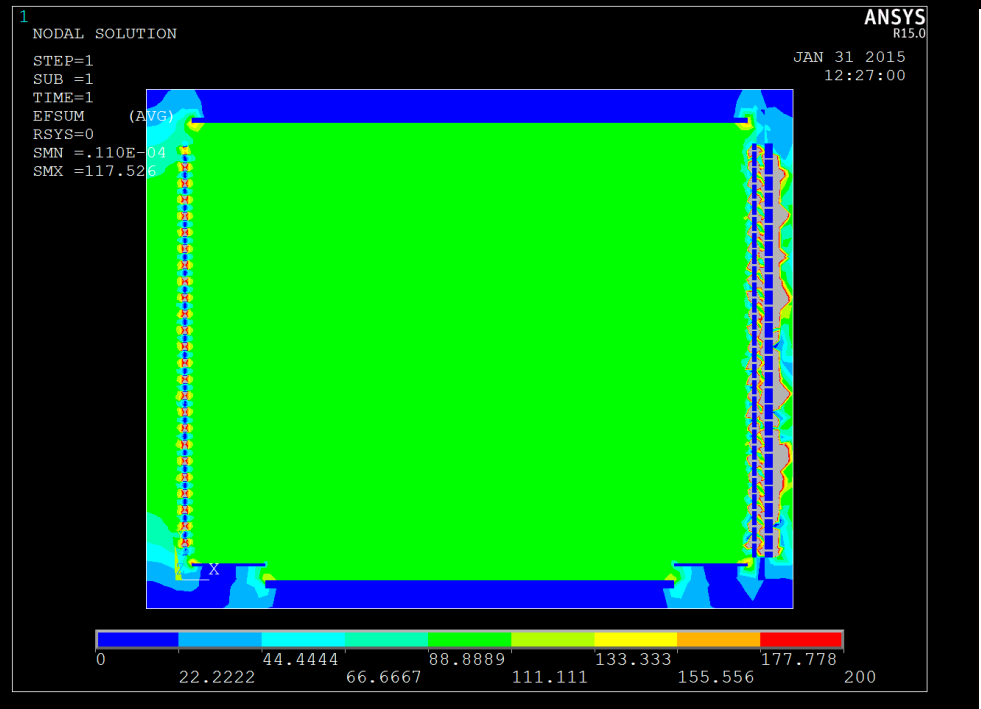




3 walls of strips;
1 wall of wires

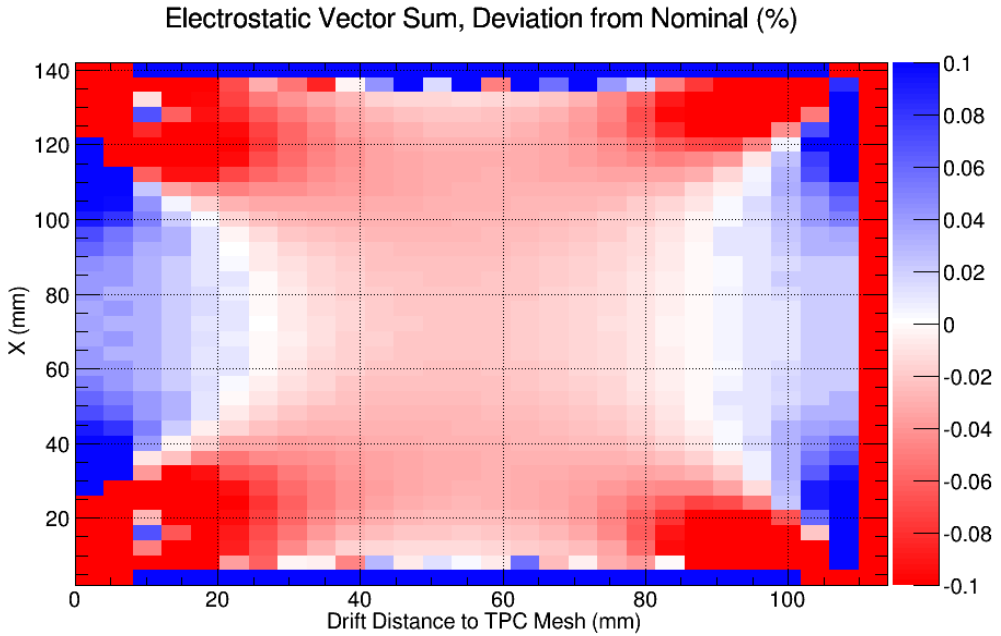
(NOTE: wire plane at low X – left side of plot)

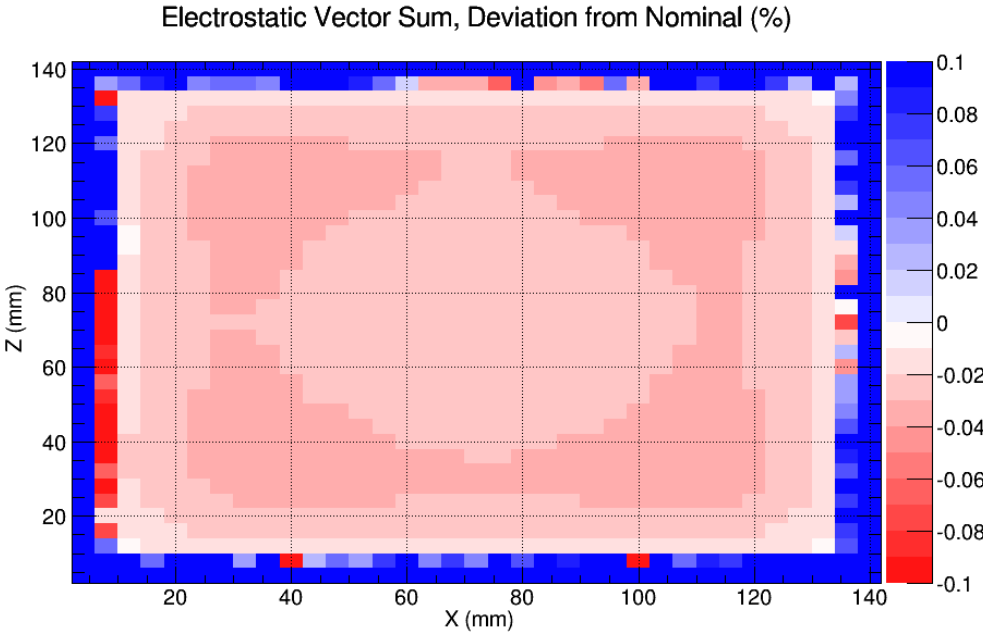




Column 1: drift direction toward left. Slice is in XY plane in middle of Z
Note: wire plane along bottom of plot (low X)

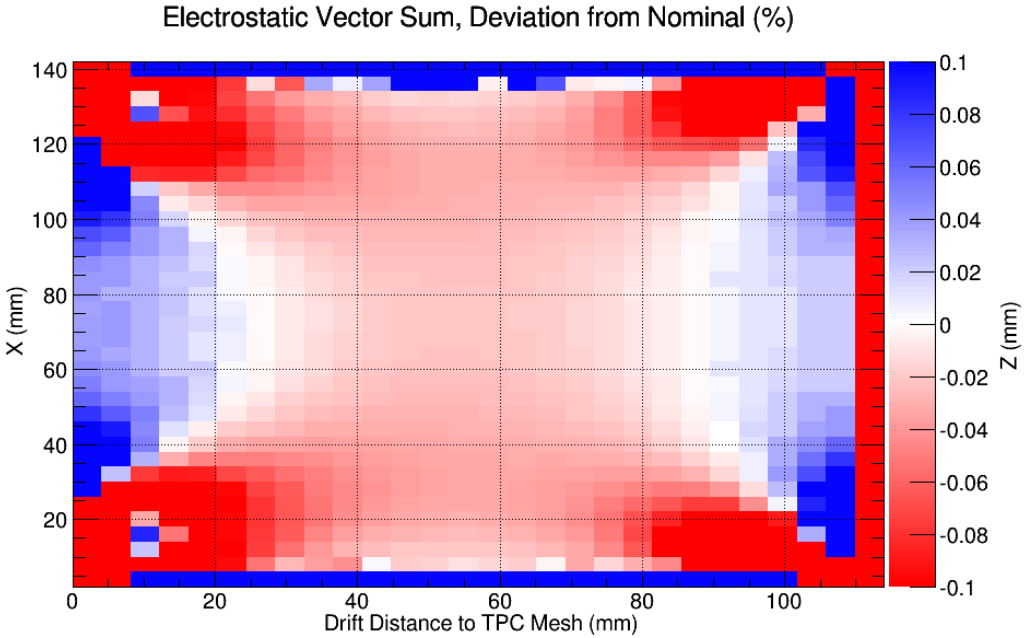
4 walls of strips

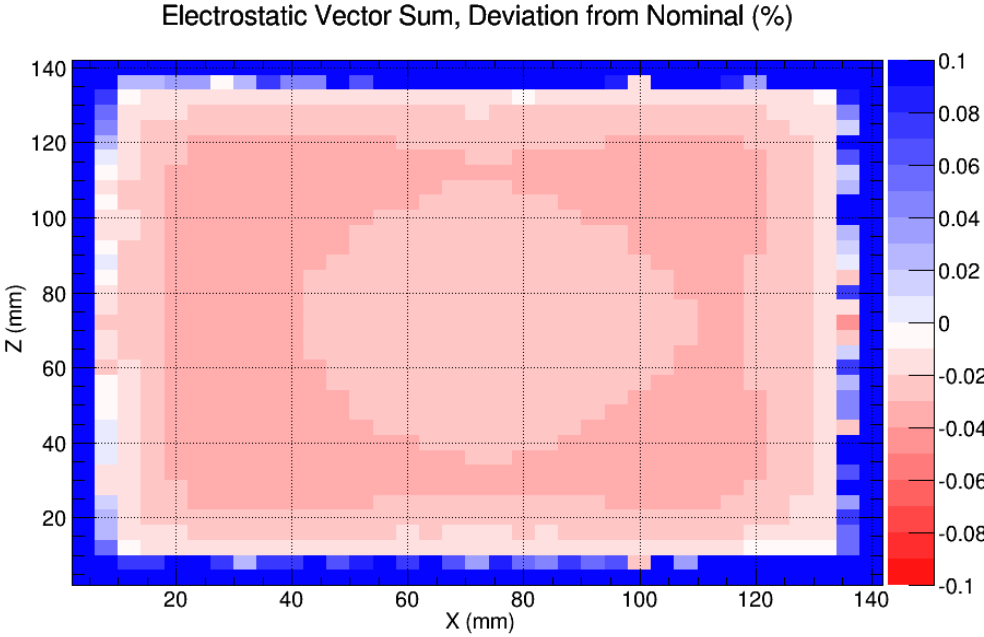




Column 2: Slice is in middle of drift plane. i.e. vector sum looking down drift plane.
Note: wire plane along left side of plot (low X)

3 walls of strips;
1 wall of wires





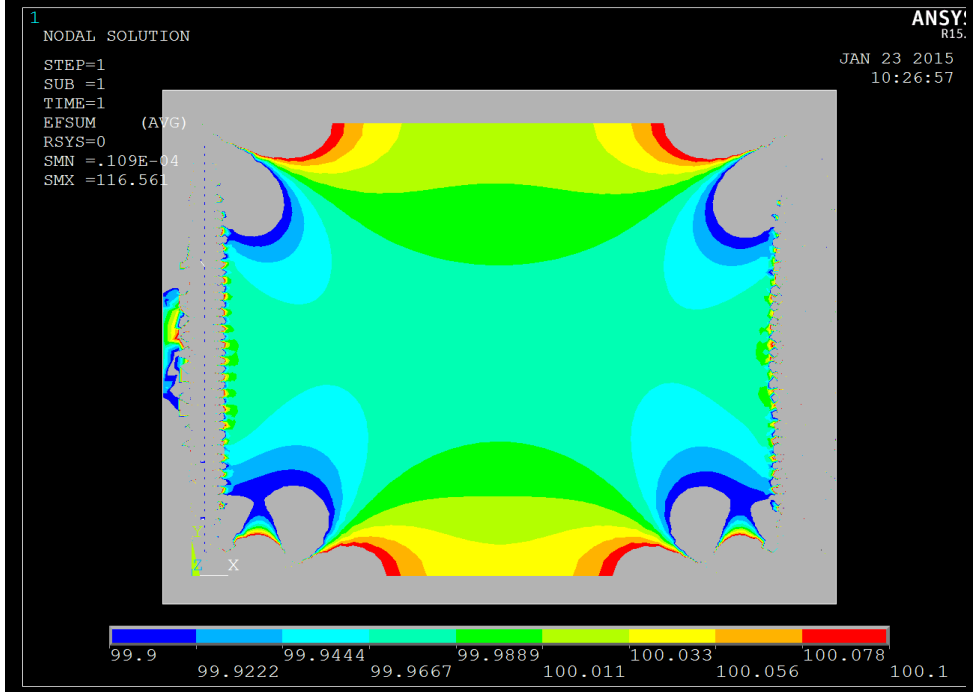
Cherenkov mesh to wire plane scan:

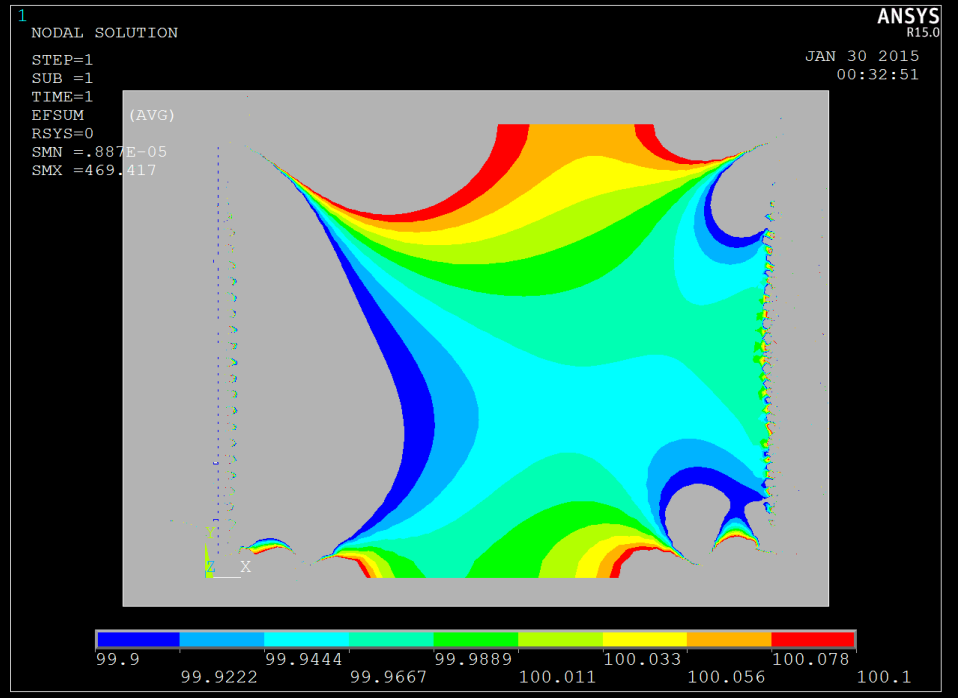
No mesh vs. mesh @ -15 mm vs.
mesh @ -25 mm vs mesh at -40 mm

51 wires (0.4 mm width) , 25.5 strips (3.5 mm width)

EF Vector Sum of
XY Slice in middle of Z (drift direction is down)

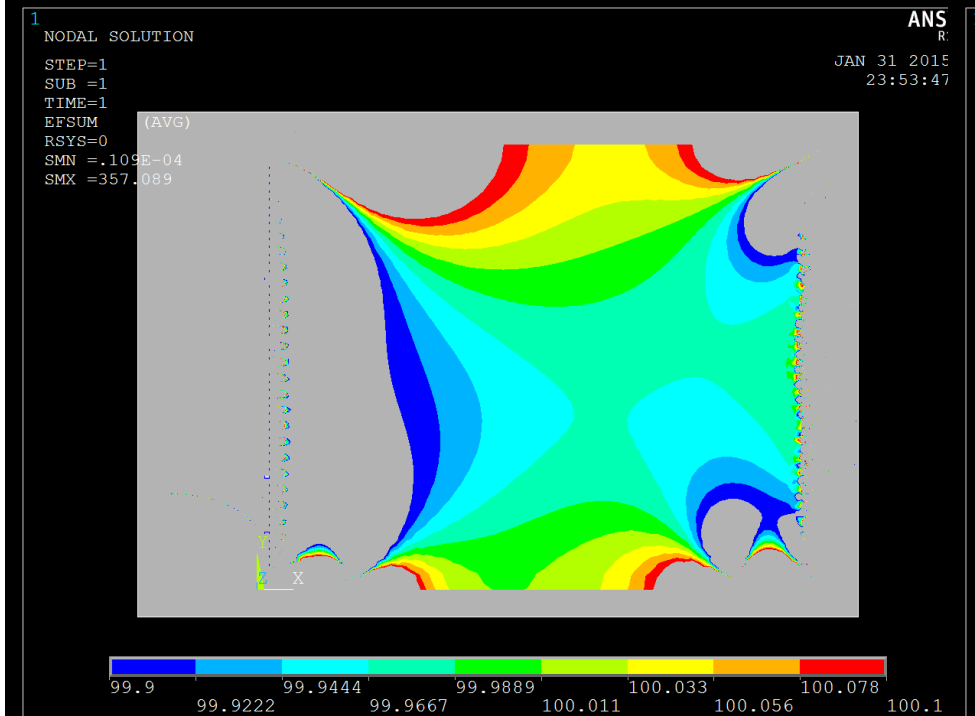
No Cherenkov mesh

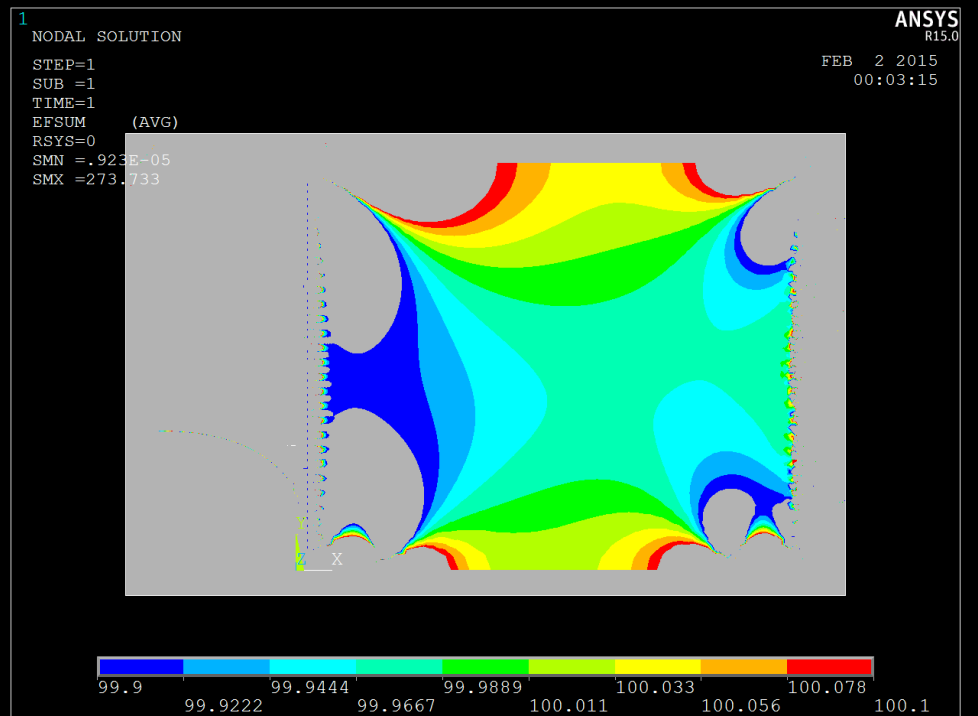




Cherenkov mesh @ -15 mm

Cherenkov mesh @ -25 mm

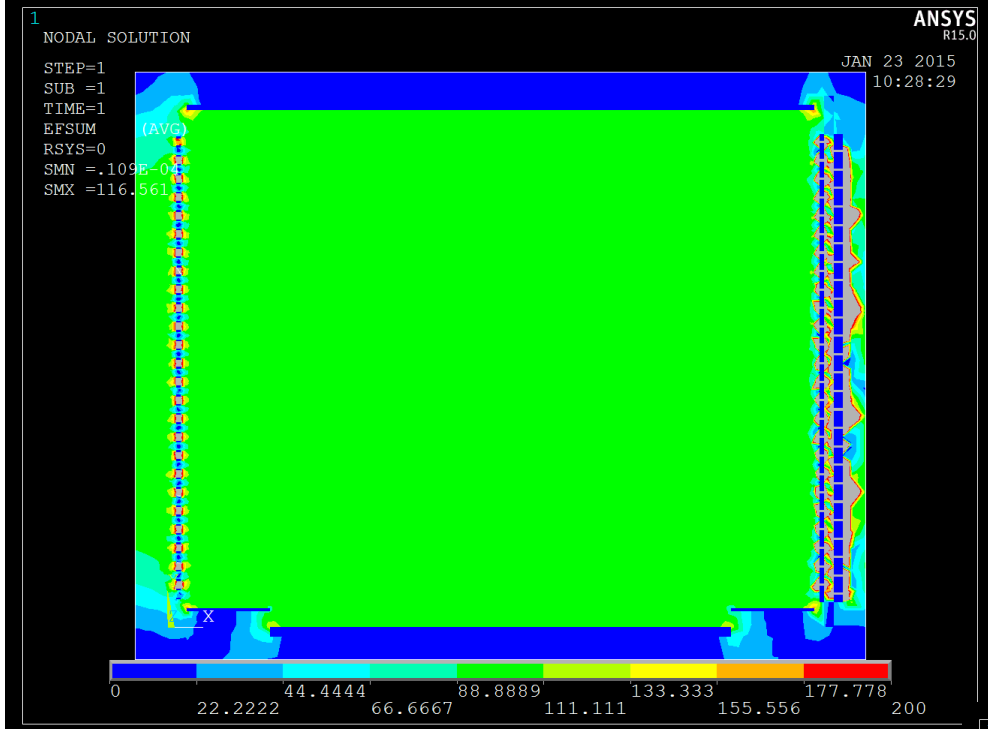


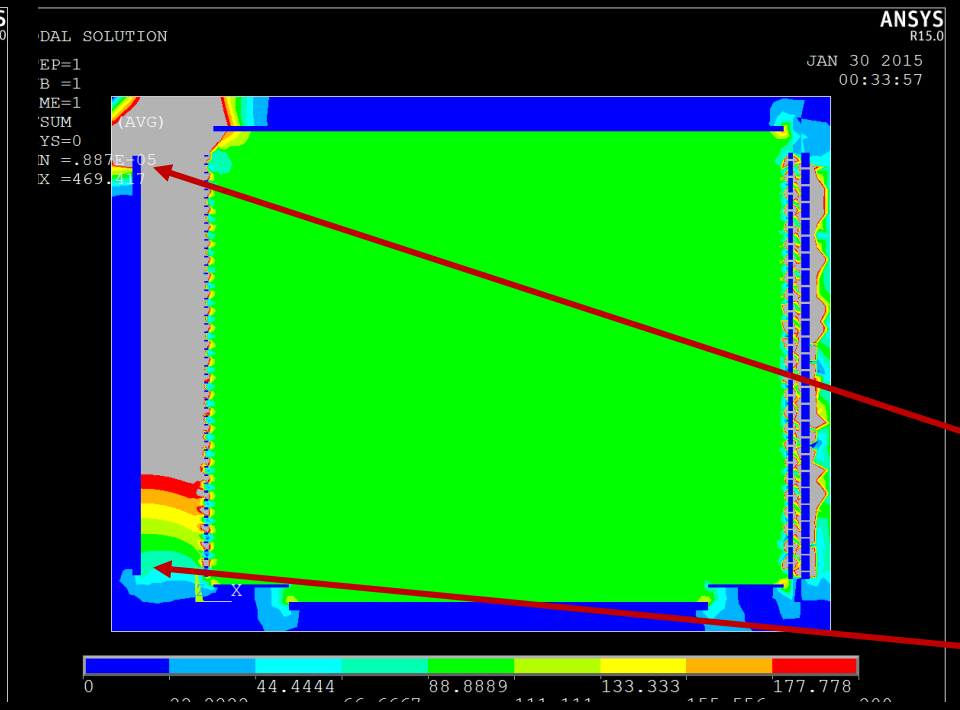


Cherenkov mesh @ -40 mm

No Cherenkov mesh

EF Vector Sum of XY Slice in middle of Z (drift direction is down)





Cherenkov mesh @ -15 mm

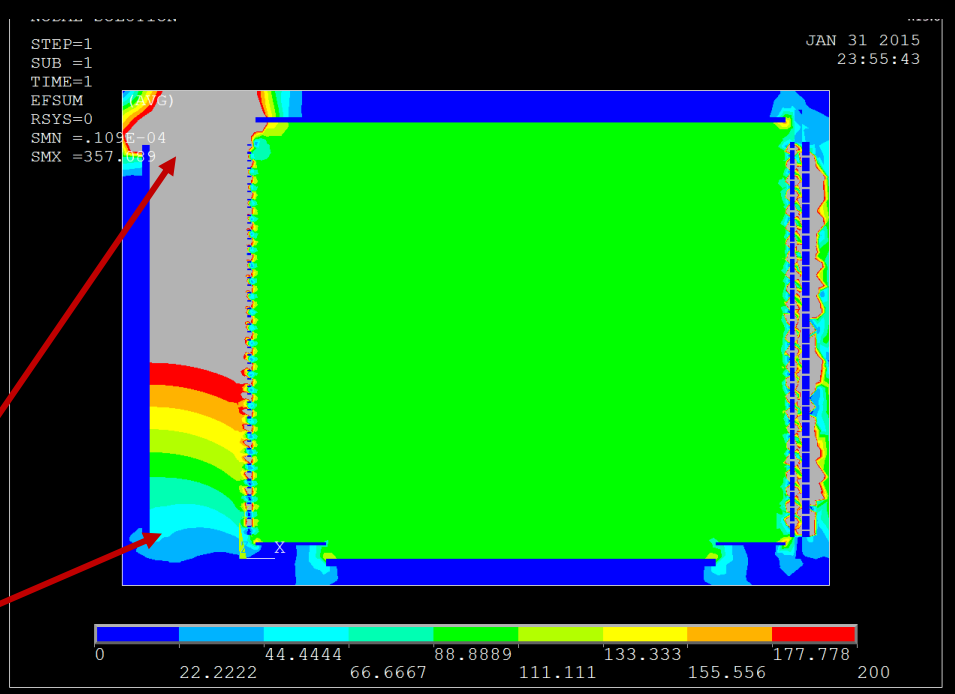
E = ~730 V/mm

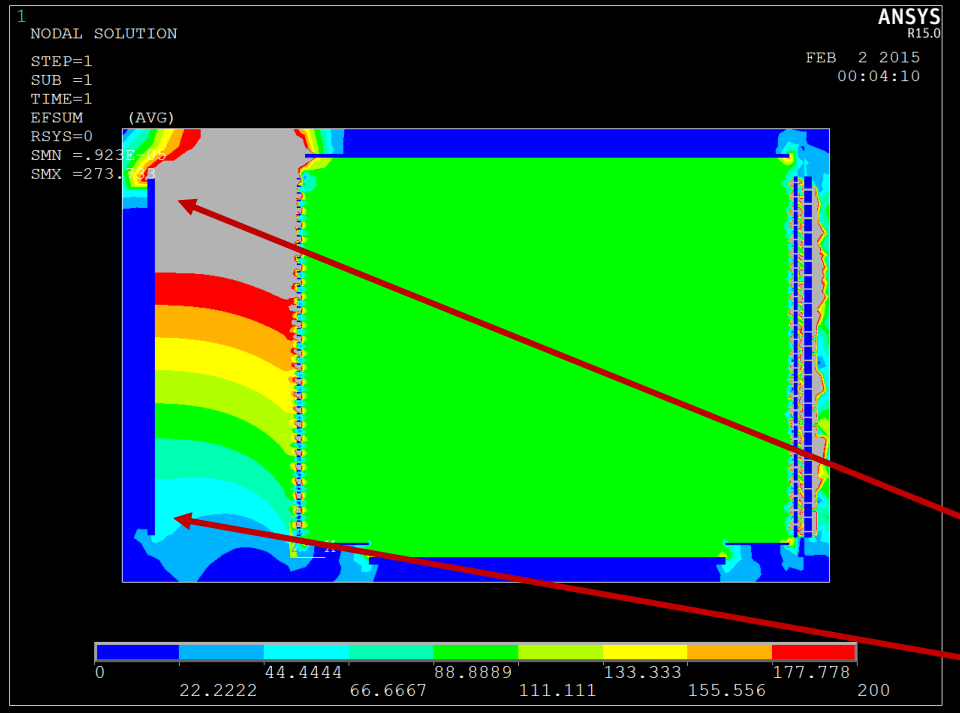
E = ~45 V/mm

Cherenkov mesh @ -25 mm

E = ~440 V/mm

E = ~30 V/mm





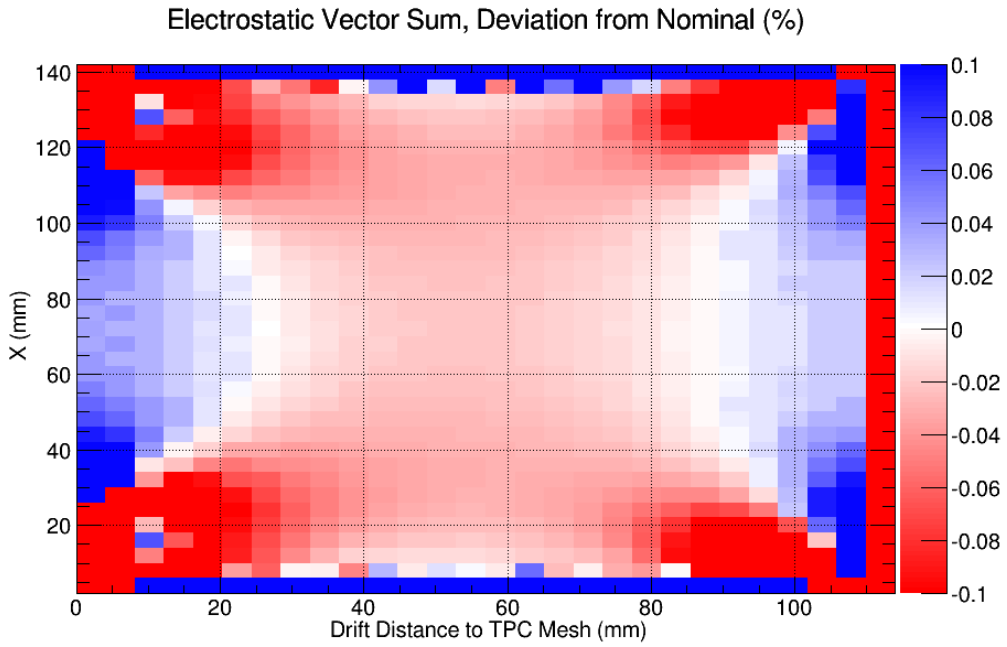
Cherenkov mesh @ -40 mm

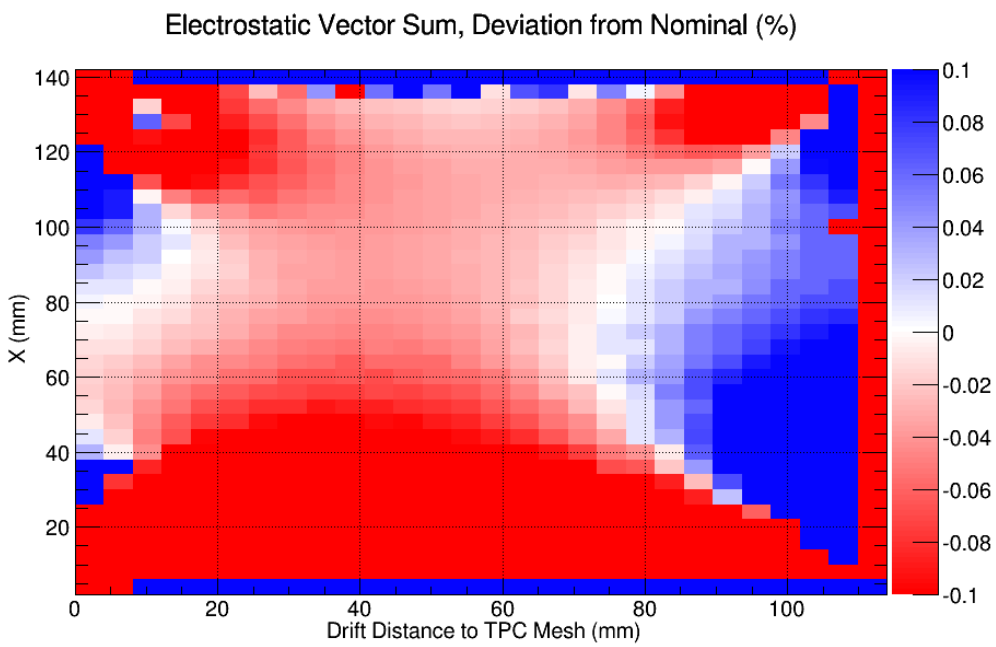
E = ~275 V/mm

E = ~18 V/mm

Drift direction toward left. Slice is in XY plane in middle of Z
Note: wire plane along bottom of plot (low X)

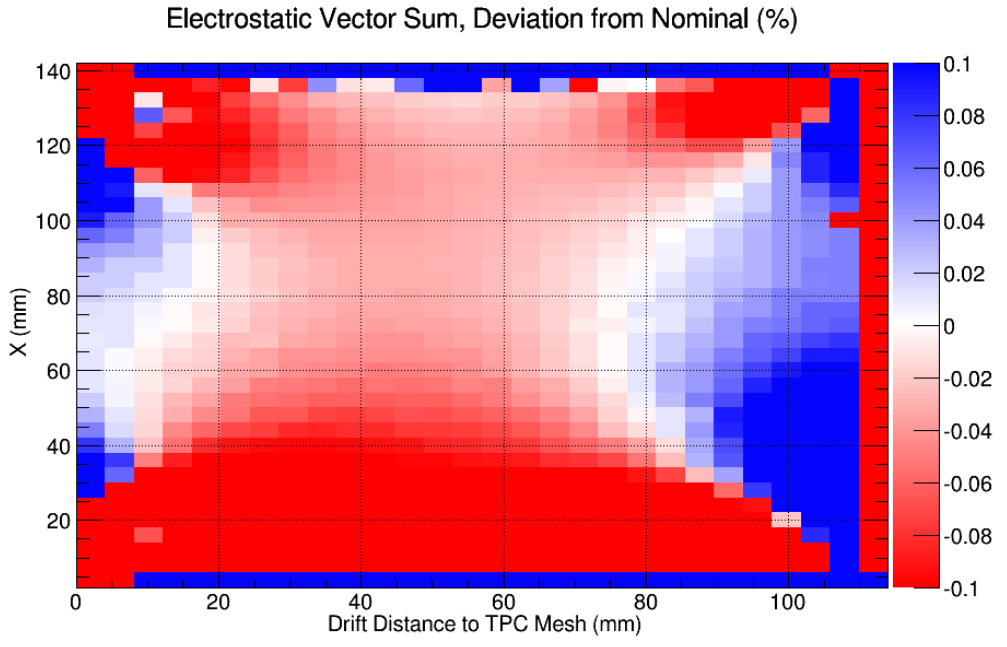
No Cherenkov mesh

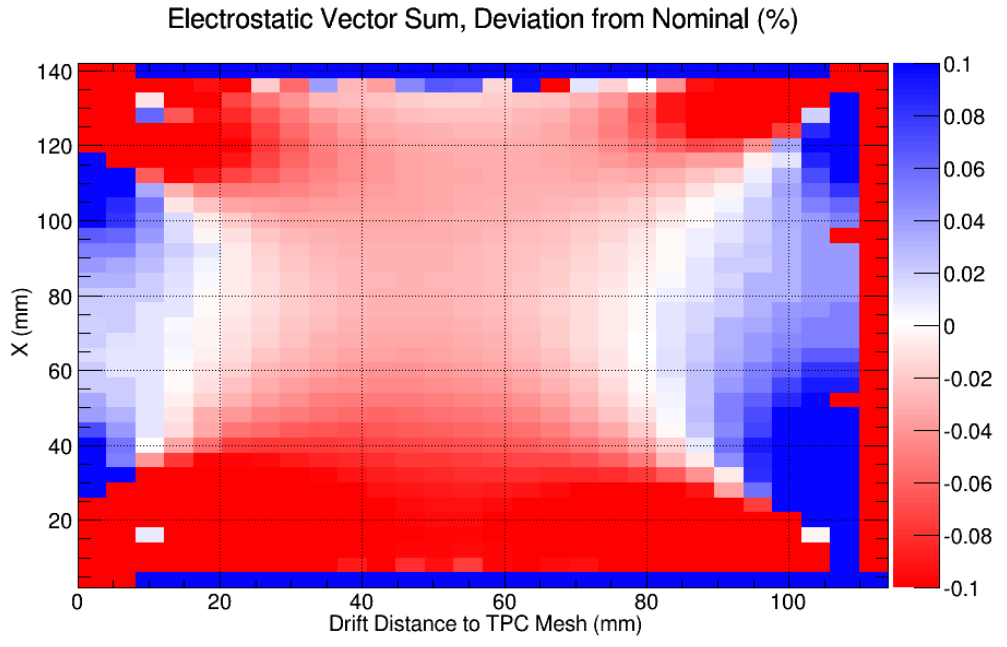




Cherenkov mesh @ -15 mm

Cherenkov mesh @ -25 mm

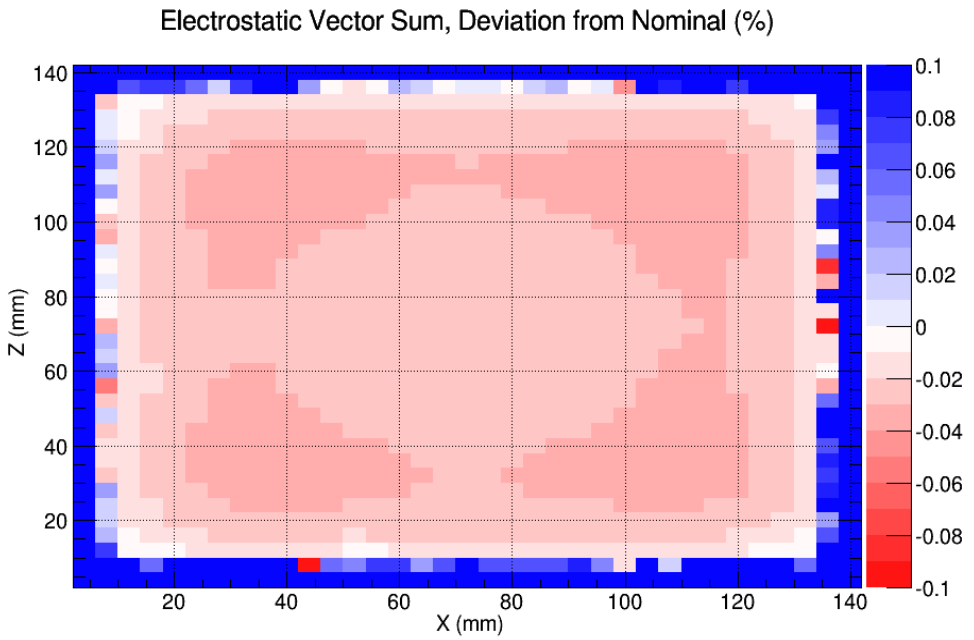


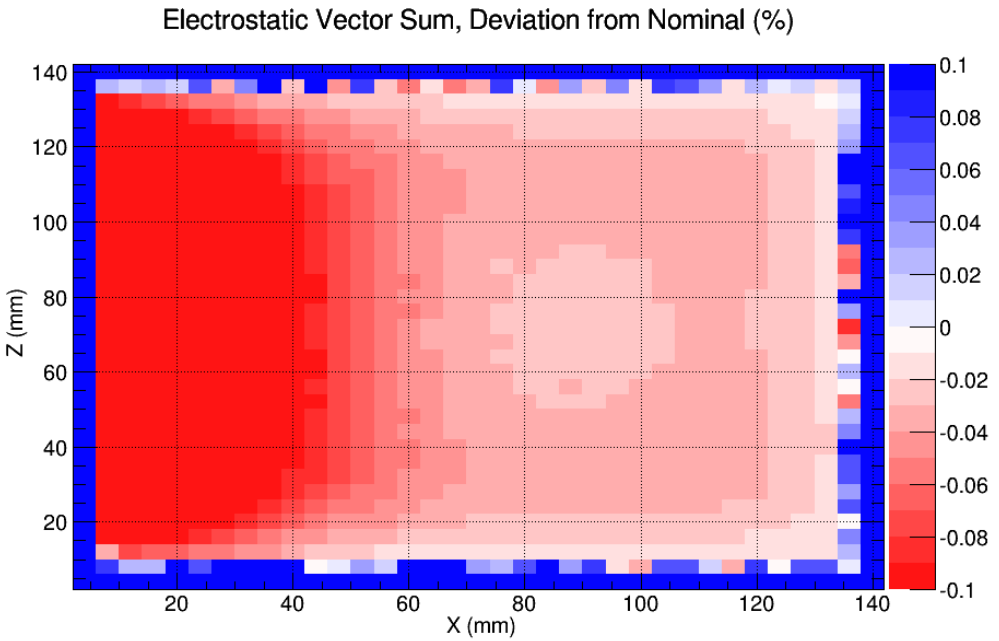


Cherenkov mesh @ -40 mm

Drift direction toward left. Slice is in XY plane in middle of Z
Note: wire plane along bottom of plot (low X)

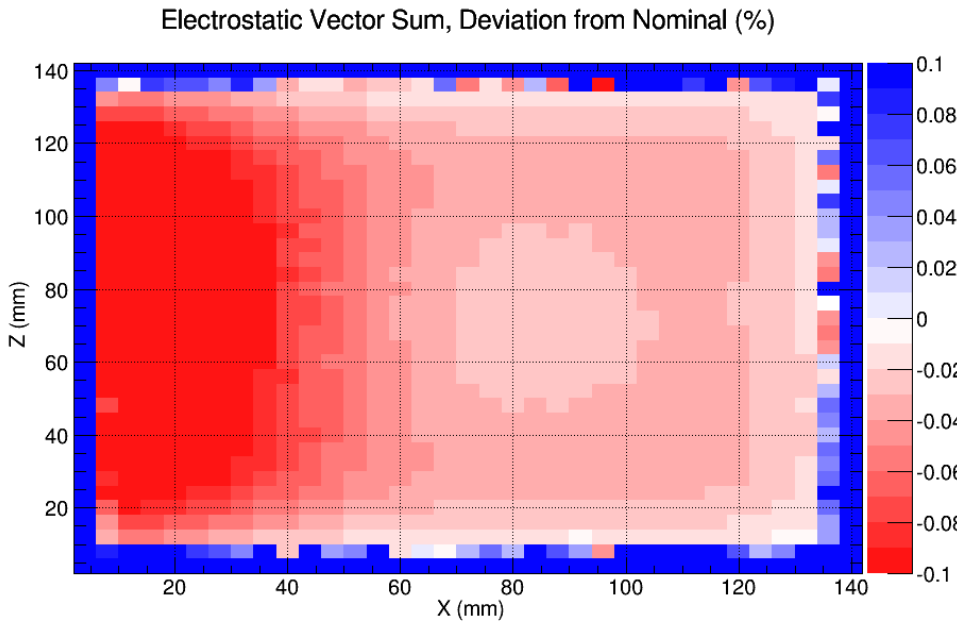
No Cherenkov mesh

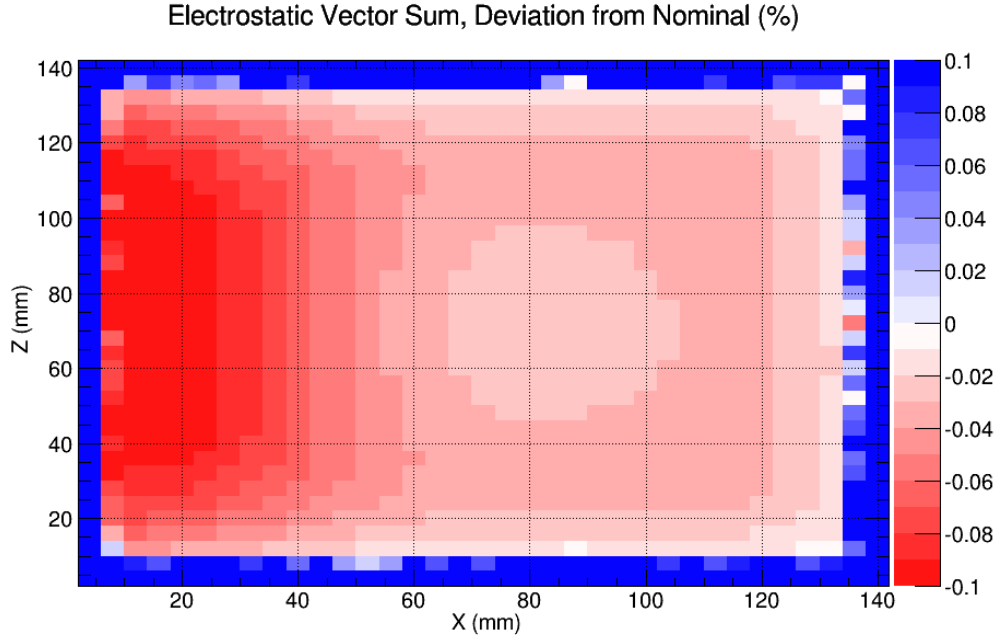




Cherenkov mesh @ -15 mm

Cherenkov mesh @ -25 mm





Cherenkov mesh @ -40 mm